

Pesticide Illness Among Farmworkers in the United States and California

Rupali Das¹ Andrea Steege² Sherry Baron² John Beckman³ Ximena Vergara³ Patrice Sutton³ Robert Harrison¹

¹ California Department of Health Services, Oakland California • ² National Institute for Occupational Safety and Health, Cincinnati, Ohio • ³ Public Health Institute, Berkeley, California

Introduction

Farmworkers are at risk for pesticide illness. There are an estimated 1.8 million hired crop farmworkers in the United States.

Several factors may account for farmworkers' high risk for pesticide-related illness (Table 1):

- English language ability may be needed for warning signs and training to be effective.
- Training may be above educational level of most farmworkers.
- Migration may be detrimental to workers:
 - they may not be familiar with hazards of changing work environment
 - they need to find and understand new clinic system for each move to a new location
- Those who lack legal status may be unwilling to seek health care.



Table 1. Demographic characteristics of farmworkers in the U.S. National Agricultural Workers Survey, 1997-1998.¹

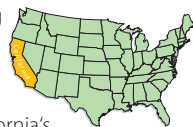
Demographic Characteristic	Mean (Range)/Percent
Age, years	31.3 (14-90)
Ethnicity—Hispanic	90%
Gender—Male	80%
English language ability	
Speak English "not at all"	45%
Read English "not at all"	63%
Place of birth	
Mexico	77%
U.S.	19%
Other	4%
Highest grade completed	Mean 6.9 years
Family income below poverty level	61%
Migrant status	
Foreign-born, in US <1 year	22%
Two or more farmwork jobs >75 miles apart	13%
Home >75 miles from farmwork job	25%
Lives and works within 75 miles of farmwork job	40%
Lacks work authorization	52%
Weeks per year doing farmwork	Mean 24.9 weeks

¹The National Agricultural Workers Survey is a nationally representative survey of crop agricultural workers carried out by the U.S. Department of Labor taking into account the seasonality and distribution of agricultural work in the U.S.

²For those farmworkers whose primary language is not English.

Pesticide Illness in California Farmworkers

- California is the top agricultural producing state in the U.S.
 - Over 186 million pounds of agricultural pesticide use was reported in 1999
 - 30% of pesticides used were on California's list of chemicals known to cause cancer or reproductive harm.
- One third of all farmworkers in the U.S. (between 0.6 and 0.75 million) work in California.



Methods

California participates in a multi-state standardized pesticide illness surveillance system funded by NIOSH and the United States Environmental Protection Agency.

In California, suspected occupational and pesticide illnesses are reportable conditions. The California Department of Health Services (CDHS) uses physician reports and medical records to conduct surveillance for occupational pesticide illness.

- A review was conducted of all cases involving farmworkers (defined by census occupational code) reported to CDHS between January 1, 1998 and December 31, 1999.
- Data was abstracted from all report sources, coded according to a NIOSH-based system, and analyzed using SAS.

Results

Table 2. Selected characteristics of farmworker pesticide illness cases, CDHS, 1998-1999.

Characteristic	Mean (Range)/N (%)
Total no. pesticide illness cases	1156
Farmworker pesticide illness cases ¹	486 (42%)
Demographics	
Age, years	34.7 (13-73)
Hispanic ²	413 (85%)
Gender—Male	387 (80%)
Time Lost From Work?	
Yes	142 (29%)
No	235 (48%)
Unknown	109 (22%)
Activity When Illness Occurred	
Mixing, loading, or applying pesticides	139 (29%)
Routine activity, primarily field work ³	313 (64%)
Other	12 (3%)
Unknown	22 (5%)

¹Farmworkers were defined by Census Occupational Code.

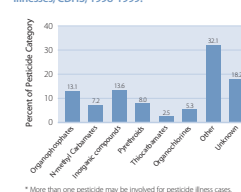
²Based on last name. Ethnicity information is not collected on reporting forms.

³Routine work activity not involved with pesticide application.

Table 3. Method of farmworker pesticide contact, CDHS, 1999.

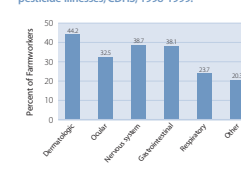
Contact Method	%
Direct contact with pesticides	17.5%
Contact with treated surfaces	13.8%
Direct spray with pesticides	14.8%
Drift away from the site of application	14.4%
Other	39.5%

Figure 1. Pesticides associated with farmworker illnesses, CDHS, 1998-1999.^a



^a More than one pesticide may be involved for pesticide illness cases.

Figure 2. Organ systems involved in farmworker pesticide illnesses, CDHS, 1998-1999.^a



^a More than one organ system may be involved for pesticide illness cases.

Summary of Findings

- Acute pesticide-related illness is an important cause of morbidity and lost work time in California farmworkers (Table 2).
- Farmworker illnesses are due to many pesticides; less than 10 pesticide classes account for over half of acute illness cases (Figure 1).
- Skin effects dominate the farmworker illnesses, although ocular and systemic effects also commonly occur (Figure 2).
- While application of pesticides remains a high-risk activity, most farmworker pesticide illnesses occur while performing non-application tasks in the fields (Table 2).
- Exposure to pesticides occurs in several ways illustrating that the use of pesticides creates a hazardous work environment for all farmworkers (Table 3).



Limitations

- The magnitude of acute pesticide illness is most likely underestimated by current surveillance systems.
- Conditions such as persistent effects due to acute exposures or chronic health effects due to long-term exposures, remain undetected by this system.
- Data on health effects of inert ingredients and pesticide combinations is lacking.

Recommendations

The effects of pesticides on farmworker health may be reduced by:

- eliminating hazardous substances /substitution with safer ones
- enforcing regulations, including hazard communication/training requirements
- educating employers, health care providers about the effects of pesticides